THE POLIS PROJECT ON ECOLOGICAL GOVERNANCE
University House 4, University of Victoria
PO Box 3060, Victoria, BC V8W 3R4
Phone: (250) 721-6388
Fax: (250) 472-5060
E-mail polis@uvic.ca
Web site: www.polisproject.org

Friends of the Earth
Les Ami(e)s de la Terre
CANADA
206- 260 St. Patrick Street, Ottawa, Ontario K1N 5K5
Phone: (613) 241-0085
Fax: (613) 241-7998
E-mail foe@foecanada.org
Web site: www.foecanada.org

SUBMISSION

FRIENDS OF THE EARTH CANADA
206 - 260 St. Patrick Street, Ottawa, Ontario K1N 5K5
www.foecanada.org
and
THE POLIS PROJECT ON ECOLOGICAL GOVERNANCE
University of Victoria, Victoria, British Columbia V8W 3R4
www.polisproject.org

to the
COUNCIL OF GREAT LAKES GOVERNORS
c/o: David Naftzger, Executive Director
35 E. Wacker Drive, Suite 1850
Chicago, Illinois, USA 60601

in response to the 90-day public review period for

DRAFT ANNEX 2001 IMPLEMENTING AGREEMENTS

PREPARED FOR THE WALTER AND DUNCAN GORDON FOUNDATION

03 September 2004

This Submission is presented to the Council of Great Lakes Governors to express our concerns with respect to the Draft Annex 2001 Implementing Agreements to the Great Lakes Compact. Before starting, we emphasize that our concerns focus on the mechanisms incorporated in the Draft Annex, not its objectives. We subscribe fully to the imperative to protect the entire ecosystem of the Great Lakes basin, including both its surface and its underground waters and its associated shorelines and wetlands.

As requested, we limit the extent of our argument and focus on recommendations. When we refer to the provisions or requirements applicable to the Council of Great Lakes Governors, we intend that those same provisions or requirements are or should be equally applicable in Ontario and Québec, the two Canadian provinces that are associate members of the Great Lakes Commission (www.glc.org/about/). Our submission is organized as follows:

PART I: INTRODUCTION AND RECOMMENDATIONS

If all interests in the Basin are considered, there is never a "surplus" of water in the Great Lakes system; every drop of water has several potential uses and trade-offs must be made when, through a human intervention, waters are removed from the system.
International Joint Commission, *Protection of the Waters of the Great Lakes* (2002), p. 43.

Our concerns begin from a premise that we state in Part II of our Submission: *viz*., ***greater water efficiency and greater water conservation are the main line of defense for protecting the Great Lakes basin ecosystem and fostering sustainable use of the region's fresh water.*** Research findings in recent decades indicate they are a very powerful line of defense. No less than one-third of all urban water uses can be saved with cost-effective efficiency measures alone, and at least as much again with individual and communal decisions regarding urban design and industrial development that save water. The same approaches will reduce flows into wastewater collection and treatment systems and, therefore, the need to invest in large-volume infrastructure. National water withdrawals are stabilizing in the United States and *may* be doing so in Canada. Why, we ask, should they continue to increase in the Great Lakes basin, if indeed they are increasing?

Recommendation 1: Full implementation of water efficiency measures and greater attention to water conservation options become mandatory strategies, rather than merely advisable options as per the current draft Annex, before any withdrawal or diversion can be considered.

In Part III of our Submission, we reiterate a point made by others about deficiencies in the data available to make decisions about either withdrawals within the Great Lakes basin or diversions to users outside the basin. Not only is hydrological badly deficient, we have only the most aggregate information about how current withdrawals are used within the basin. We know even less about the forces that are leading to greater than anticipated levels of conservation. As a result, we have no way of projecting impacts of decisions about increasing (or decreasing) the use of the waters of the Great Lakes basin. Though all decisions about natural resources are made with some degree of uncertainty, making decisions with long-term social and ecological consequences in the absence of vital information runs counter to the precautionary principle.

Recommendation 2: Adopt a precautionary approach in the Annex to ensure that no further major withdrawals or diversions are permitted until specific improvements are made in the data base available for water policy and management.

Finally, in Part IV we take issue with a single word in what is, in our view, the best public document from a Canadian perspective on Annex 2001: Andrew Nikoforuk's Political Diversions: Annex 2001 and the Future of the Great Lakes (www.powi.ca/nikoforuk-june2004.pdf). Mr. Nikiforuk's Recommendation 13 reads as follows:

"Set conditions for out-of-basin withdrawals based on three simple standards:
"1.) A public trust standard
"2.) A conservation standard
"3.) A no-net-loss standard."

Our point is that none of these three standards are "simple" (nor do we believe that Mr. Nikoforuk intended to imply that they are). We accept the legitimacy of each of these standards. Therefore, we conclude with a two-part recommendation:

Recommendation 3a: Explicit public trust, conservation and no-net loss standards be made operational for all use of water in the Great Lakes basin; Recommendation 3b: Strict standards should apply both to out-of-basin diversions and also to new withdrawals within the basin, though we do not argue that those standards should be the same.

In putting our position forward in this Submission, we want to acknowledge the large body of work that has already been written on the Great Lakes. We cannot even begin to cite all this work, but its burden shows that we already know a lot more about water efficiency and water conservation than we apply. We therefore fully support Mr. Nikoforuk's position that the greatest current concern about water use in the Great Lakes basin is not diversion outside the basin but needless and heedless over-use within the basin.

PART II: THE CASE FOR WATER EFFICIENCY AND CONSERVATION

The traditional response to gaps between water supply and demand is to increase supply. Beginning from Roman times, we have brought water to cities and fields by building larger dams, drilling more deeply, and extending pipelines further. However, costs to develop new water supplies are doubling every decade. And increasingly, as in the Great Lakes basin, the need to avoid or mitigate social and environmental impacts is adding to those costs – and in some cases halting supply projects altogether. The problem is not with the engineering but with the goals of the entrenched supply-side approach, which relies on ever greater, ever more distant sources of supply.

The alternative to conventional supply-side management is demand management. The scope for cutting water use by managing demand is huge, particularly in Canada and the United States, which have been egregiously wasteful in their use of fresh water. That scope depends upon two forces: *water efficiency* and *water conservation*. Though overlapping in both cause and effect (each is, for example, promoted by higher prices for water), the two are conceptually distinct. "*Efficiency*" refers to technical and economic approaches to reducing the quantity of water used to achieve a given task, as with watering lawns with low-flow sprinklers; "*conservation*" refers to changes in the nature of the task, as with planting greenery that does not require watering.

Determining the potential for water-use efficiency is time-consuming but can be accomplished through sector-by-sector and use-by-use measurements that do not strain known methodologies. A large literature is already available on water-saving technologies together with estimates of their cost-effectiveness for various degrees of water saving. Determining the potential for water conservation is more difficult. Conservation includes some relatively easy changes in individual habits and practices, such as replacing lawns with drought-tolerant ground cover, or using grey water for outdoor use around buildings and homes. However, conservation also includes more complex communal decision-making concerning urban design and industrial planning to reduce the impact of suburbanization and limit the growth of such water-intensive industries as aquaculture, aggregate mining, and irrigated agriculture. Conservation therefore has much broader social and economic impacts than efficiency, and is even more powerful in achieving significant, lasting water use reductions.

Though Draft Annex 2001 Implementation Agreements include some positive wording relating to water efficiency and conservation, the full potential of these approaches to protect the Great Lakes ecosystem and move toward sustainable use of the basin's fresh water remains largely unrecognized. Our central criticism is that water efficiency and conservation are tabled in the Annex as *components* of the withdrawal/diversion proposal process rather than the *basis* of a strategic approach to ecologically sustainable water management. Further diversion or withdrawal of water, both within and outside of the Great Lakes basin, should be a last resort, open to consideration only when all opportunities to reduce current demand have been implemented.

Substantial reductions in water use are possible without reducing the quality or quantity of end-use services through comprehensive, strategic planning and implementation of water efficiency and conservation. Water 'saved' through such measures can be redistributed to support economic development or to restore degraded ecosystems – or it can be left in place to support in-situ uses. The overall impact is a reduction (or ideally, elimination) of further diversion and withdrawal of Great Lakes water. Water efficiency and conservation also often result in financial benefits. For example, reducing water use can delay or eliminate the need for costly expansion of water and wastewater infrastructure.

Water made available as a result of increased efficiency and conservation must come to be recognized as a legitimate, dependable "new" source of water. Indeed, "it has been demonstrated in many countries that saving water rather than the development of new sources is often the best 'next' source of water, from both an economic and environmental point of view" (Wegelin-Schuringa, 2002). The following examples illustrate the potential for water efficiency and conservation to save money and reduce water use.

- In 2003, the Pacific Institute in Oakland, California published one of the most compelling cases for increasing the efficiency of urban water use. Based on a detailed analysis of water demands, and technical and policy options for increasing water use efficiency, the authors estimate that water use in the state could be reduced by one third with existing technology. At least 85% of this reduction can be achieved cost-effectively.[1] The study, entitled "*Waste Not, Want Not*," concludes that "the largest, least expensive, and most environmentally sound source of water to meet California's future needs is the water currently being wasted in every sector of our economy."

- An earlier report by the same group, entitled *"Sustainable Use of Water: California Success Stories"* provides details on 28 different initiatives that have proven successful in reducing water use. Initiatives documented span municipal, industrial and agricultural sectors. Examples include ascending rate structures, water efficient landscaping, leak detection and repair, installing water saving equipment, altering or introducing crop rotations, and ecological restoration activities.

- A number of successful water efficiency efforts also exist within the Great Lakes basin. For example, the Region of Waterloo's water conservation program reduced per capita water use by 10% in its first three years, and the community of Port Elgin avoided a $5.5 million expansion of water treatment facilities by investing $550,000 in a water conservation program (Brandes and Ferguson, 2004; Canadian dollars).

[1]The authors define cost-effectiveness as the point where the marginal cost of the efficiency improvements is less than or equal to the marginal cost of developing new supplies.

Despite these and other indications of the potential for water efficiency and conservation, they remain largely under-utilized in water planning and management. For the most part, water managers and policy makers view these approaches as emergency measures to deal with seasonal variability of supply (*e.g.*, summer drought) rather than as the basis of a long-term strategy for sustainable water use.

Much of the resistance to water policies based primarily on efficiency and conservation stems from the common assumption that a reduction in water use is associated with reduced economic prosperity or standard of living. However, data from a number of countries indicate that this is not the case. In the US, total water withdrawals increased in lock step with rising GDP for much of the 20th century. During the 1980's these trends began to diverge, and since 1985, total withdrawals have been declining while GDP has continued to rise. This "decoupling" of water demand and economic output has also been observed in Japan, China and Finland (Gleick, 2003; Wolff and Gleick, 2002). Although there is no conclusive evidence of this trend in Canada, regional information (which is badly outdated), suggests that it is occurring here as well.

These examples clearly support the potential for efficiency and conservation to address the growing cultural, economic and ecological needs for fresh water. To realize this potential, the focus of Great Lakes water policy and planning must shift from conventional approach of regulating supply (withdrawals and diversions) to eliminating waste and managing demands. Over the long term, water managers and policy makers should be looking to share knowledge and experience, not water, with those areas that continue to base community and regional planning on new or expanded access to water from the Great Lakes basin.

PART III: MISSING INPUTS FOR DECISION MAKING

Insufficient information is available to reach effective , long-term decisions about further withdrawals of water from the Great Lakes basin or diversions of water to other basins. These information deficiencies are equally significant with respect to a) hydrological and ecological characteristics of basin's natural resources, and b) socio-economic characteristics of demand patterns for use of water from the basin. In making this claim we are mindful of the efforts that have already been made, particularly by the International Joint Commission and the Great Lakes Commission to provide an adequate data base (see, for example, the tabs for Water Use and for Data and Monitoring on the latter's web site: www.glc.org). Academics have also been active in supplementing these efforts, particularly in the more difficult areas, such as agriculture where we note the work of de Loë, Kreutzwiser and others at the University of Guelph. However, data gaps remain so large as to preclude sound management and planning. For example:

- All reports from the IJC and Galloway and Pentland's report (2003) for the Munk Centre at the University of Toronto emphasize how little we know about what is increasingly referred to as the sixth great lake: the groundwater basin. Given that the basin appears to be shrinking, and that ground waters and surface waters interact in complex ways, it is dangerous to presume, simply from the fact that only a small share of current withdrawals are from groundwater, that no long-term damage is being done. As stated in a report prepared for the IJC by the International Water Uses Review Task Force (2002; p. 76), "Mapping groundwater throughout the Great Lakes region will be a long, arduous process." The same report notes that an official from the USGS commented that to then there had "been little done in response to the Commission's call for unified consistent mapping of boundary and transboundary hydrogeological units" (p. 77).

- We are equally incapable of determining, on the basis of current knowledge, how much water can be withdrawn from the Great Lakes without impairing their ability to provide the wide range of services – some commercial, as with fishing and transportation; some not, as with habitat preservation – on which all residents of the basin rely. General estimates (not related specifically to the Great Lakes basin) range from 30% or 40% (typically prepared by agriculturally inclined organizations) to 10% (typically prepared by environmentally inclined organizations). In the one reference specific to the Great Lakes, Nikiforuk cites a statement by David Schindler of the University of Alberta to the effect that even 5% withdrawal outside the basin could cause permanent damage to the Great Lakes. This issue is further complicated because of the uncertainty as to just which uses are consumptive, and by how much. At present, the share of use that is consumptive is typically set by convention, not by measurement. The same USGS official referred to in the previous paragraph also lamented that no progress had been made on obtaining "improved estimates that reliably reflect the true level and extent of consumptive use" (p. 77).

- Turning to socio-economic information, the IJC's Final Report *Protection of the Waters of the Great Lakes* just four years ago indicated that experts were divided even on whether consumptive uses of water were growing or declining. A more recent report states that ". . . we can now say with a relatively high degree of confidence that the consumptive use 'problem' has been consistently and significantly overstated for the past three decades." Unfortunately, current data surveys and estimation methods provide few indications of *why* this has occurred. We have only the most general idea of the extent to which conservation and efficiency are factors in reducing water use, as compared with other factors, such as lower-than-expected economic growth. More importantly, assuming that conservation and efficiency are playing a role, we have no idea at all where this is occurring – across the board, or only in certain sectors; in one or all jurisdictions. Nor do we know why it is occurring – in response to higher prices, as a result of environmental concerns, on the basis of better technology, or a combination of these and other factors. As indicated in the IJC Final Report, there is little reason to place much trust in available data for anything but gross withdrawals; sectoral and jurisdictional data are too inconsistent to be of value in decision-making.

In summary, the states and provinces working within the Great Lakes Compact are in no position to reach long-term decisions in the face of divergent claims about the water resource and its use. Though it is typically necessary to reach decisions in the absence of full information, we maintain that, based on the precautionary principle, current data gaps are so great that it is inappropriate to increase either in-basin withdrawals or out-of-basin diversions. Moreover, all of these elements of uncertainty are significantly increased by climate change. As stated succinctly by Nikiforuk, "Climate change has left no margin for error in water management on the Great Lakes" (p. 15).

PART IV: CRITERIA FOR DECISIONS

As indicated earlier, Nikiforuk suggests that three standards be satisfied before out-of-basin diversions can be considered:
1) Public Trust standard
2) Conservation standard
3) No Net Loss standard.

We agree that these three standards are appropriate and, further, that they are equally as appropriate to within basin withdrawals as to out-of-basin diversions. However, none of the three is easy to define in an operational manner as is necessary when making decisions regarding shared or common resources such as the Great Lakes waters. We therefore outline approaches to applying them, starting from "No Net Loss," which is easier to define than "Conservation," which is in turn easier to define than "Public Trust."

No Net Loss Standard

The standard of No Net Loss seems to be more quantitatively clear than it really is. In addition to ensuring that diversions involve no quantitative loss of water from the basin, at least two further questions immediately arise:

- Does "No Net Loss" refer only to water quantity or to water quality as well?

- Does "No Net Loss" apply regardless of timing, or does it apply over a period of time.

Our answers are that No Net Loss must be defined in terms of quality as well as quantity, and that both should apply over relatively short periods of time. For example, water that is withdrawn for use in farming and that flows back to the basin will be degraded to some degree. On the other hand, water that is withdrawn for urban purposes and that passes through tertiary treatment before return to the basin may be improved in quality. (We are writing in principle; in practice, many water treatment plans are major sources of pollution.)

Similarly, if the No Net Loss standard is to be applied over time, how long a time period is acceptable? If interpreted without a time criterion, neither diversions nor withdrawals for consumptive uses could be accepted, which is not reasonable. Therefore, some balancing is required. One year seems appropriate: Within any year diversions or withdrawals could exceed return flows or be of diminished quality, but over a year they should be equal in both quantity and quality. An escape clause would have to be added to allow for prolonged drought or heavy flood. Such an escape clause should be narrowly written and only come into effect after agreement at the highest levels.

Conservation Standard

A conservation standard must include both water efficiency and water conservation, as we have defined the terms above. Therefore, it should have two general components. The first component would require that all reasonable water efficiency measures be in

place prior to permitting further diversions or withdrawals. The second component would require that reasonable efforts toward water conservation also be in place. Each component requires further definition.

- The efficiency portion of the Conservation Standard could be effected by a list of measures, including full cost water pricing, that can be used to assess the extent to which reasonable water efficiency measures are being implemented. "Reasonable" would be defined by cost-effectiveness, and more particularly by cost-effectiveness from the perspective of the water system. Though considerable gains can be made by charging water users the full cost of supplying water to them, even greater efficiencies can be achieved by valuing water in comparison with the cost of the next increment of water supply that would be required in the absence of efficiency – what economists refer to as "opportunity costs." (In principle, this too can be accomplished by pricing. However, it is much easier to explain politically why water price should be based on full costs than on opportunity cost.) Further, not only do market failures block full operation of the price system, but some costs, as with environmental protection, are social in nature and not easily allocated to individual transactions. Pricing is therefore a necessary but not sufficient condition for effecting efficiency. In addition to full cost pricing, non-voluntary water efficiency measures will have to be enacted by appropriate jurisdictions, particularly for uses that are highly consumptive or that significantly degrade water quality. Application of this sort of efficiency component is exactly what we have proposed be applied to new Permits to Take Water in the Province of Ontario, as expressed in our joint submission on the Government of Ontario's *White Paper on Source Protection*.

- The conservation component of the Conservation Standard is more difficult to establish. Again a list of possible measures can be used, but it would be inappropriate to impose particular values or particular growth limitations on each jurisdiction. On the other hand, it is one thing to respond to requests to supply water for drinking and sanitation purposes and quite another for watering lawns or for promoting ecologically destructive industries. Therefore, the conservation component would likely have to be effected by a mathematical calculation applied to each jurisdiction in the basin. The calculation would have the effect of mandating a percentage reduction in water use above gains that can be made through greater efficiency. That percentage might reasonably be expected to increase over time. Purely as an example, for the first five-year period, conservation savings of only 5% above efficiency gains would be expected, and then 10% for the second five-year period, and 15% for the third. Of course, expected efficiency gains would also be increasing in time, so these measures would, cumulatively, represent significant efforts toward reducing water use.

Public Trust Standard

The Public Trust Standard is by far the hardest to define. (We are aware that Public Trust has a specific meaning in US law. Here we are speaking more generally.) Society, working through its elected officials, must determine just what is included within

the concept of public trust for management of the Great Lakes. Further, each component of that determination must have sufficient objective content to make it measurable in some way, otherwise the criterion has hortatory but not operational value. The ultimate goal of the concept of Public Trust is to express in concrete terms the application of the goals of sustainable and equitable development for the people and the ecology the Great Lakes basin.

Time does not permit even a cursory discussion of how to establish a Public Trust Standard. We suggest only that it would have to include such diverse issues as:

- preserving basin ecosystems
- defining different but complementary roles for scientific advisory bodies and political decision-making bodies
- setting absolute limits on how much of a given resource can be captured for use in any period of time, and to what extent (if any) the quality of return flows may be degraded
- ensuring adequate participation of stakeholders in decisions that affect them
- ensuring equity within and among water using sectors and groups
- making special provisions for First Nations using water in traditional ways
- ensuring equity among current and future generations.

Though far from easy, we are convinced that something on the order of an operational Public Trust Standard must be created in order to reach long-term decisions about the use, and the non-use, of the waters of the Great Lakes basin.

We have stated our case as succinctly as possible, and we respectfully commend it to your attention. For further information, please contact:

David B. Brooks, PhD
Director of Research
Friends of the Earth Canada
dbrooks@foecanada.orgomb@uvic.ca
613-241-0085 X27

Tony Maas and Oliver M. Brandes
Research Associates
POLIS Project on Ecological Governance

250-721-6388

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